# A TWO-STAGE MODEL OF DECISION-MAKING OVER FINANCIAL REPORTING REGIMES AND TECHNIQUES: ANALYSIS AND UK CASE STUDIES

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**Abstract**

This paper develops a new two-stage decision model to explain the choices of financial reporting *regimes* (e.g. IFRS or UK GAAP) and *techniques* (e.g. valuing intangibles, by cost, income, or market methods) for UK companies. The theoretical framework is based on the choice theory of orderings (*Lex* and *CoLex*) and is expressed in decision trees which capture firms' actions, based on calibrated benefits and costs. The decision-making processes are examined through three UK empirical case studies (one private and two public firms), that expound their decision trees, and explain their decisions. We probe the rationale of their decisions using field-work investigation methods, through which we develop a 'stated preference' metric of choice, which allows us to interpret how decisions are made, and how they differ: over time (notably when regime changes are being implemented e.g. the emergence of New UK GAAP post-2015); and across firms (where factors like ease of execution and the quality and quantity of information needed for decisions, are shown to play a large part).

**Keywords**: IFRS, case studies, decision making, preferences, accounting choices

**JEL Codes:** D21, D22, G38, M21, M41

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## Introduction

This paper applies preference orderings and utility functions to formalise companies' choice behaviours as a two-stage choice model (Castano & Castano, 2012; Colman & Stirk, 1999; Houy & Tadenuma, 2009); and then illustrates this modelling approach using a set of three UK case studies. The theoretical framework aims to discover whether a company's decision-making process is sequential or nested (Birnbaum, 2010; Colman & Stirk, 1999; Hensher, 1994; Tabuchi, 1994), and – if sequential - whether a firm chooses regimes or techniques first. Our case studies (Cooper, & Morgan, 2008), founded on field work within UK companies, enable us to illustrate comprehensively how, in practice, the detailed characteristics of corporate decision-making proceed (Cardinaels, 2008; Trotman, Tan, & Ang, 2011). This is viewed through the lens of our two-stage model, which considers such key features as exposure to risk, the complexity of financial reporting, and the time pressure of deadlines.

Companies, like individuals, have preferences, which allow them to order options e.g. goods, strategies, and techniques (Simon, 1959). As part of this, firms have preferences over accounting techniques (e.g. market or cost approaches to valuing intangibles) and financial reporting regimes (e.g. IFRS or UK GAAP). We introduce two types of preference orderings, *lexicographic* (*Lex* for short) and the *co-lexicographic* (*Colex* for short) (Castano & Castano, 2012; Colman & Stirk, 1999; Houy & Tadenuma, 2009), which help us to explain how companies make accounting choices over regimes, and the techniques that support them. Our approach treats such corporate decision-making as potentially a two-stage choice problem. The instruments used were: (a) a questionnaire that determined utilities, in a stated preference fashion (Adamowicz, Louviere, & Williams, 1994), of costs and benefits of certain actions, using Likert scales; and (b) a semi-structured interview schedule (Cohen, Krishnamoorthy, & Wright, 2002; Wengraf, 2001) with three main parts: choice of financial reporting regimes (with probes on factors in choosing, cost/ benefit of choosing etc.); choice of financial reporting techniques (with probes on intangibles, development costs etc.); and the rationale or choices (with probes on staging, decision making, reasoning etc.).

The structure of the paper is as follows. Section 2 covers the theory and method of this paper, covering choice theory and the field work methods by which primary source data in the UK were obtained. In Section 3, a private firm's (Company Alpha) decision-making process across time is elaborated, in terms of its use of a *sequential* choice mode. By contrast to this private company, Section 4 illustrates a public firm's choice behaviour (Company Beta) for a *nested* choice mode, combining elements of both a *tied* and a *free* choice. Finally, a third case study illustration is provided, in Section 5, again of a public company (Company Gamma), which is used to compare the results with those in the previous two sections, with an emphasis on ease of execution, transparency and compliance. To conclude, Section 6 summarises the findings of this paper. Briefly, four points stand out. First, there is clear evidence of both Lex and CoLex two-stage decision making across firms, but also – less expected – within a firm (e.g. for a given firm, at two distinct points in time – before and after 2015). Second, 'choice' can be driven by laws/regulations - essentially 'tied' choices are ubiquitous and such regulations can transform the utilities of accounting modes. Third, there are diverse 'styles' that underpin decision modes, some highly subjective, and others more quantitively driven. Fourth, and finally, if a firm is confident enough to dispense with two-stage decision making, choosing simultaneously, rather than sequentially (viz. adopting the *nested* mode), doing so will typically have higher data requirements.

## 1. Theory and Method

This section expounds the theory and method behind this paper. The theory is based on individual preferences, which drive choosing behaviour (Simon, 1959). This leads to a discussion of choices which are made sequentially, which in practice can be applied to choices over financial reporting regimes and the techniques that support them. On these theoretical foundations, choosing behaviour is developed in terms of ways of making decisions where sequences are essential (e.g. choosing a financial reporting regime before choosing the technique that supports it; or choosing a technique that matches existing skills, then choosing the financial regime in which it can be best deployed). This leads to a theoretical framework that permits analysis of two-stage decision making in lexicographic (Lex) of co-lexicographic (CoLex) terms: briefly ordering like books in a library - or the converse (Castano & Castano, 2012; Colman & Stirk, 1999; Houy &

Tadenuma, 2009). Thus, we show how sequential decisions can be analysed in terms of game trees that display potential decisions at each stage, and the payoffs (in terms of net or ratio utilities) that are attached to each potential action within the game tree.

Our methods are partly questionnaire, and partly field work based, and involve gathering UK data on individual preferences at the corporate level, that allow a calibration of preferences in terms of utilities. Utilities so derived are 'stated preferences', being acquired directly from the person making the choice (typically the financial director), rather than indirectly from market data (e.g. via a 'demand curve') (Adamowicz et al., 1994; Hensher, 1994; Schipper, 2010). These utilities permit calibration (typically by a five-point Likert scale) of benefits (B) and perceived costs (C) of choices made, which in turn can be used to calculate *net benefits* (B - C) or *ratio benefits* (B/C), in utility terms, of actions taken by financial directors over regimes and techniques.

Combining theory and methods allow us to consider choosing behaviour in terms of alternative ways of achieving complete choices in two stages; or alternatively to consider choices as being intrinsically simultaneous (or 'nested') (Birnbaum, 2010; Colman & Stirk, 1999; Hensher, 1994; Tabuchi, 1994). These choosing modes, once fully explained, are explored empirically in this paper using three illustrative corporate case studies from the UK, that display a revealing range of rational choosing behaviour, including effects over different time horizons.

*2.1 Theory*

As mentioned before, companies also have preferences over various alternatives (Simon, 1959). For example, firms have preferences over accounting regimes (i.e., a whole system of accounting standards, such as IFRS) and accounting techniques (i.e., a detailed method allowed within a regime, such as fair value approach of valuing investment properties). In this paper, two types of preference orderings, *lexicographic* (*Lex* for short) and the *co-lexicographic* (*Colex* for short), are introduced. The *Lex* approach is like ordering books on a shelf in a library (e.g. preferences for shelving books, denoted by the inequality sign, <, on word strings for book names, might be expressed as: a < aa < aaa < ab < aba). As we shall see

below, the CoLex approach is in a sense the converse or mirror image of the Lex method. We will use Lex and CoLex concepts to help us explain how companies make accounting choices over regimes, and the techniques that support them. Our approach treats such corporate decision-making as a two-stage choice problem.

*Lexicographic (Lex) Ordering*

Consider sets X and Y, whose elements will be used by personnel within the firm (e.g. the financial director) to make decisions (e.g. about regimes and techniques). Let $X=(x_1, x_2)$ and $Y=(y_1,y_2)$, where $x_i$ and $y_i$ are corresponding utilities of X and Y. If an individual's preference follows a lexicographic order, X is preferred to Y if and only if $x_1 > y_1$, or $x_1 = y_1$ and $x_2 > y_2$ (Colman & Stirk, 1999; Houy & Tadenuma, 2009).

In the framework of a two-stage choice model, we suppose $x_1$ and $y_1$ are the utilities of choice in the first stage, and we regard $x_2$ and $y_2$ as the utilities of choice in the second stage. In this situation, if an individual applies a lexicographic ordering, it implies that he or she first deals with the choice problem of the first stage (i.e., considering utilities $x_1$ and $y_1$), and then determines the options in the second stage (i.e., evaluating utilities $x_2$ and $y_2$). This decision-making process involves a sequential choice, which moves from the first stage to the second stage. Existing literature (Birnbaum, 2010; Colman & Stirk, 1999) on this kind of sequential behaviour emphasises that when choices in the first stage are perceived as more crucial than those in the second stage, people tend to make decisions in a lexicographic order.

*Colexicographic (CoLex) Ordering*

This is a less well known preference ordering, but one useful to our purpose: the colexicographic (CoLex) ordering, Bekmetjev, Brightwell, Czygrinow, and Hurlbert (2003) and Castano and Castano (2012). In a sense that will become clear, this ordering compares elements choice sets from the opposite direction to the lexicographic (Agrawal & Salinas, 1988; Bekmetjev et al., 2003; Heuberger & Muir, 2007).

Considering again the sets X=($x_1$, $x_2$) and Y=($y_1$,$y_2$), a colexicographic (CoLex) ordering implies that X is preferred to Y if and only if $x_2 > y_2$, or $x_2 = y_2$ and $x_1 > y_1$. A person with CoLex preferences considers the choices listed in the second stage (i.e., comparing utilities $x_2$ and $y_2$) before making decisions about the choices in the first stage (i.e., weighing utilities $x_1$ and $y_1$), and, in this sense, goes in the opposite direction to the person with Lex preferences. Again, the CoLex choice pattern is sequential, but is the exact opposite of the Lex choice pattern, starting as it does from the second stage. It has been observed (Castano & Castano, 2012) that when individuals care more about the choice problem of the second stage than that of the first stage, they tend to apply a CoLex orderings.

While lexicographic (Lex) orderings play an important role in studies of choice behaviour in economics, there has been very little accounting research which uses, or applies, this concept. To the best of our knowledge, only one study has attempted to analyse accounting choices using lexicographic orderings. In an experimental study of decisions in auditing, Uecker and Kinney (1977) illustrate how practitioners might prioritise certain rules, and apply Lex orderings when making judgements. As far as we know, no study yet explains firms' accounting choices by CoLex preferences. In addition to the Lex and CoLex preferences, other decision-making patterns are possible, of which the most important is that individuals might elect options from both stages simultaneously (Hensher, 1994; Tabuchi, 1994; Tu & Goldfinch, 1996). In this paper, this will be called a *nested* or *un-staged* choice. An analysis of livestock markets by Bellemare and Barrett (2006) illustrates how the *nested* choice pattern can arise, in what might seem a two-stage model. In their work, the first stage was deciding whether to enter market, and the second stage was deciding to what transaction amount. They found evidence of both staged (i.e. sequential) and simultaneous (i.e. nested) behaviour, and their empirical evidence suggested that the sequential choice pattern leads to better outcome than the nested.

We now take our discussion of two-stage decision models into the accounting domain. If a firm first chooses the i-th financial reporting regime ($X^i$) without considering the technique choices, and then chooses

the j-th technique ($X^{ij}$) under this chosen regime, this will be our first type of sequential choice (from stage one to stage two). This is a *Lex* decision-making process. In this situation, this firm chooses from the choice set of financial reporting regimes $\{X^1, X^2, \ldots\}$ selecting the one that generates the highest utility $u(X^i)= x_i$. It then chooses the technique combinations with the highest utility, which we denote as $x_{ij}$. Each accounting choice $X^{ij}$ can be considered as an ordered set $X^{ij} =(x_i, x_{ij})$, where the first utility $x_i$ is related to the regime choice and the second utility $x_{ij}$ is associated with the choice of technique combinations. The utility of an accounting alternative $X^{ij}$ will be determined by the utility of the relevant regime choice and technique choice and can be expressed as a (joint) function of regime and technique utilities, $u(X^{ij})=f(x_i, x_{ij})$. Since all technique combinations under regime i will share the same regime utility $x_i$, this firm now only needs to compare the second utility items $x_{ij}$ under this chosen regime. Furthermore, the utility associated with technique combination $x_{ij}$ is a function of utilities of different techniques for treating various parts of financial reports. This can be expressed as $x_{ij} =f(\mathbf{x}_{ijk})=f(x_{ij1}, x_{ij2}, \ldots)$, where the *k* index denotes different financial reporting techniques.

Consider now the second-type sequential choice: Suppose now the company first selects techniques and then decides its regime. Its decision-making process starts from the second stage and moves on to the first stage. That is, this firm follows a CoLex preference ordering when choosing accounting modes. The company first considers the utilities of technique combinations $x_{ij} =f(\mathbf{x}_{ijk})$, where the argument of f(.) is a vector of techniques, indexed by *k*. After electing the technique combination with the maximum utility, this firm determines its financial reporting regime, by comparing utilities of regimes $\{x_1, x_2 , \ldots\}$.

The third type of choice behaviour, in the two-stage choice model context, is called a *nested* choice or a *simultaneous* choice. In a *nested* choice, the firm considers and evaluates all available choices of regimes and techniques and chooses the accounting mode $X^{ij}$ which maximises the utility $u(X^{ij})=f(x_i, x_{ij})$. When choosing the accounting mode $X^{ij}$, this company determines its regime and technique simultaneously. The firm does not make accounting choices in stages and the nested choice is derived from balancing the utilities of regimes and techniques. It is when the relative importance, in utility terms, of regime choices and technique

choices is very evident, having little ambiguity, that a company tends to make accounting decisions simultaneously. Although there is no specific preference ordering to express the nested choice, this decision-making process is often discussed in choice studies e.g. Bellemare & Barrett (2006), Hensher (1994), as it presents a rational alternative to staging. For assistance in understanding our subsequent analysis of the three case studies, Table 1 summarises the three choice patterns we have examined and used in this paper, and their corresponding preference types (viz. *Lex*, *CoLex* and *Nested*).

**Table 1: Choice Patterns and Preference Orderings of the Two-Stage Choice Model of Accounting Modes**

| **Choice Patterns** | **Preference Orderings** |
|---|---|
| Sequential Choice (Regime → Technique) | Lexicographic (*Lex*) ordering |
| Sequential Choice (Technique → Regime) | Co-lexicographic (*CoLex*) ordering |
| Nested/Simultaneous Choice | No preference ordering (*Nested*) |

2.2 Method

Based on the methodology of *stated preferences* (i.e. preferences elicited by direct interviews with individuals, rather than deduced from market data) (Adamowicz et al., 1994; Hensher, 1994; Schipper, 2010), our research obtains UK firms' perceived costs and benefits of adopting accounting modes by two instruments: a survey questionnaire and a semi-structured interview agenda (Cohen, et al., 2002; Wengraf, 2001). From the perceived benefits (B) and adoption costs (C) of regimes and techniques, expressed as perceived utilities and dis-utilities, obtained by these instruments, using Likert scales, companies' net (B-C) and ratio (B/C) utilities of implementing regimes and techniques were calibrated. These net and ratio utilities allow us to examine companies' decision-making in our two-stage choice model of financial reporting regimes and techniques, in a detailed way, by the development of three illustrative case studies (see Sections 3, 4 and 5 below) (Cooper, & Morgan, 2008).

Our instrumentation derives from Reid and Smith's research (2007a and 2007b) in which the stated preference approach was applied to examine willingness to adopt FRSSE. In the current context of regimes and techniques, the financial manager would be asked, for example, what the *benefit* of a *regime* was on the scale: N/A, Zero, Low, Medium, High, Extreme. This is then coded as: 0 for not applicable, 1 for zero, 2 for low, 3 for medium, 4 for High and 5 for Extreme. Thus, the solution set for net utility (B – C) is {-4, -3, -2, -1, 0, 1, 2, 3, 4}, and the solution set for ratio utility (B/C) is {[0.2, 0.8], 1, [1.25, 5]}. In the case of the former metric, (B – C) > 0 indicates net benefit, and (B - C) < 0 denotes net dis-benefit. For the latter metric, there is benefit if B/C lies in the range {1.25, 5} and dis-benefit if its value lies in the range {0.2, 0.8}.

Regimes were considered under the headings of (a) Current and (b) Post 2015 regimes. For current, the regimes that could be chosen were: IFRS and current UK GAAP. For Post 2015, the regimes that could be chosen were IFRS and NUK GAAP, the latter being New UK GAAP. The above metrics were applied to the choices made over these two classes of regimes, in a postal/electronic questionnaire which used the Likert scale described in the previous paragraph. This questionnaire had four parts. Part one considered company characteristics (e.g. size, launch date, markets, sector, financial structure, ownership, organization). Part two considered financial reporting regimes (e.g. current adoption and expected adoption post-2015). Part three considered financial reporting techniques (e.g. intangibles, development costs, investments). Finally, part four considered: choice making and choice sequencing over regimes and techniques; the connection between choices on regimes and techniques; and the relative importance of techniques, compared to regimes.

More detailed analysis of choosing modes was accomplished using, in face to face interviews, a semi-structured interview instrument with a three-point agenda: (a) choices of *financial regimes*, with probes on choice, factors in choosing, and net and ratio benefits of choices; (b) choices over *financial reporting techniques*, with probes on intangibles (cost, income, market), the treatment of development costs (expenses assets), and the valuing of investments (market, fair, cost); and (c) the *rationale of choices*, with probes on choices over regimes and techniques, staging and decision making, the reasoning behind choices, and decision making. Indications of

the forms of our instrumentation are provided in an Appendix.

Our random sample was derived from database populations of 1383 public firms in Datastream and 168 private firms in Bloomberg's. Twenty-one firms were sampled, using the four-part postal/electronic questionnaire, twenty public and one private; and of these, 16 reported on their perceived costs and benefits of adopting IFRS. The project was funded by the Carnegie Trust, and involved field work throughout the UK, with site visits to these sixteen firms, for face to face interviews, using the three-part semi-structured interview agenda. The firms ranged across the SIC codes, from heavy manufactures (SIC codes 10-30) to public, private and social services (SIC codes 84-99). Interview data were supplemented with public domain data to help build contextual material for our case studies, and then the whole body of date were encrypted for anonymity.

## 2. Private Company Alpha: Sequential Choice (Lexicographic Ordering and Co-lexicographic Ordering)

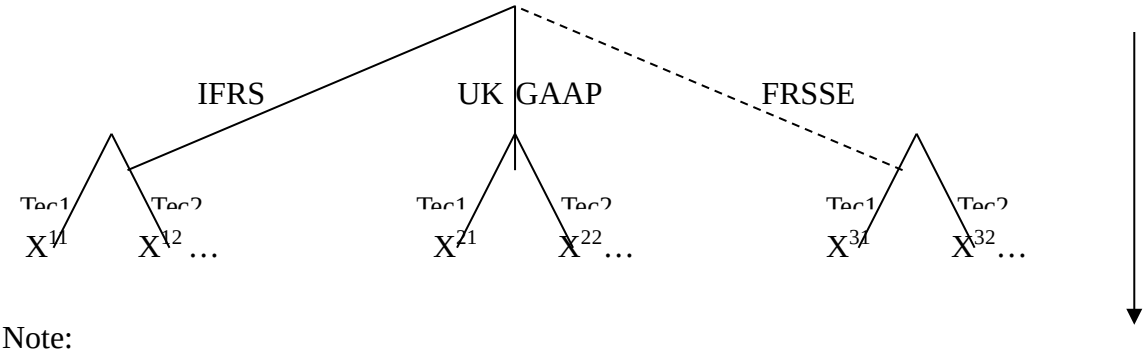
Company Alpha was a UK-based private firm. It was a motor retailer and it operated other businesses related to motor vehicles, such as repairs and insurances. As a private firm, it had free choice: over consolidated accounts as compared to individual accounts. Since its major competitors were public firms, the compulsory adoption of IFRS for public firms' consolidated accounts from 2005 also had an impact on it. Furthermore, the authority aimed to replace the current UK GAAP with a new UK GAAP, including FRS 101 and FRS 102, from 2015. Company Alpha used UK GAAP for all its accounts, and the introduction of New UK GAAP implied that there would be some changes in accounting for Company Alpha. These two changes (viz. IFRS and New UK GAAP) were very significant in terms of financial reports. Therefore, we investigate in this section how Company Alpha behaved when faced with these two major policy changes in accounting, using our two-stage choice model for illustration.

*Lexicographic (Lex) Ordering* Here we examine Company Alpha's decision-making process immediately before 2005, this being a time when its main competitors were required to adopt IFRS for consolidated accounts. The respondent of Company Alpha said that he chose the regime first, and then made the technique choices straight after. He added that under

different regimes, techniques would alter. For example, the methods of amortisation under various regimes would be distinct. After the company had decided on the regime, the technique choice would follow. This implies that the regime choices would influence the technique options.

We note that the IFRS had different regulations from UK GAAP in many aspects. When the Company Alpha made its regime choice, it also had to decide what techniques to use. As described by the interviewee, Company Alpha's decision-making process was sequential: regime choices were made first, followed by technique choices. The respondent of Company Alpha also argued that techniques across various regimes were very similar. Summing up, using the concept of preference orderings, we conclude that Company Alpha's choices followed the pattern of a lexicographic ordering (Colman & Stirk, 1999; Houy & Tadenuma, 2009). In practical terms, this meant that when it faced regime and technique choices, right before 2005, it first compared available regimes and then chose the one which maximised its utility in this stage, before next choosing its financial reporting techniques. In the event, Company Alpha did adopt UK GAAP, as indicated by a higher adoption utility than under IFRS. The decision tree of Company Alpha, with relevant adoption utilities indicated, can be found in Figure 1. In the parentheses shown in Figure 1, ratio utilities are given first, followed by net utilities. It can be observed that adopting IFRS led to a ratio utility of 0.5 and a net utility of -2. Using UK GAAP and FRSSE both generated better ratio (0.67) and net utilities (-1). The downward arrow to the right in Figure 1 indicates that the decision-making started from regime choices, followed by technique choices. This is the sequential variant.

**Figure 1: Decision Tree of UK Private Company Alpha (Until the End of 2014)**




Note:

(1) Utilities are given in the parentheses. Ratio utilities (B/C) are given first, followed by net utilities (B-C) e.g. for (B/C), $X^1=0.5 < X^2 =0.67$ suggests UK GAAP chosen.

(2) The arrow indicates the decision-making process is sequential, from regimes to techniques.

(3) The FRSSE is only applicable to subsidiaries' accounts. Hence, the FRSSE alternative is presented using the dashed lines.

(4) There is assumed to be no great difference in techniques across regimes.

The respondent of Company Alpha stated that when determining regimes, it focussed on assessing the material needed to prepare financial reports under such regimes. It then chose the simplest financial reporting regime, and this process was typically judgement-based, without involving many calculations. Our finding is that UK GAAP is perceived to be easier to use, because it fits the company's business operations better, and can be explained to shareholders using less efforts. The interviewee further stated that the company was family-run, and sought simplicity of operations, including accounting decisions. Thus, ease of execution is important in the choosing process. To conclude, Company Alpha's accounting choices are highly contingent on its ownership form (i.e. being a family-owned, private firm).

This illustration indicates that the overall simplicity of a regime was a crucial factor for Company Alpha when it made accounting decisions. Additionally, the respondent of this company indicated that he perceived no big difference in techniques across various regimes. This comment suggests that the choice of technique would not have as great an influence on the firm as would the choice of regime. Thus, if regime choice outweighs technique choice, from the manager's perspectives, this would

explain why Company Alpha made its decision sequentially (i.e. it first chose a regime, and then a techniques) (as in Figure 1).

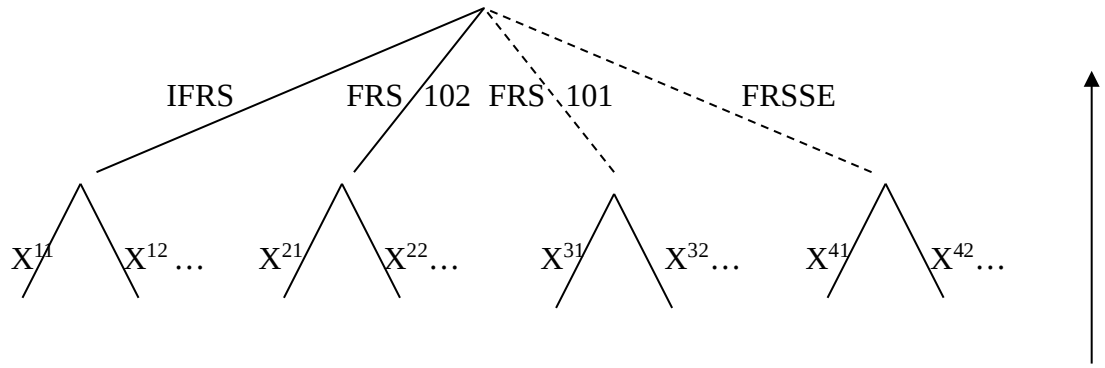
*Co-lexicographic (CoLex) Ordering*

How Company Alpha decided the regime and techniques when faced with the introduction of New UK GAAP in 2015 is now explored. The context is when new UK GAAP (NUK GAAP) replaced the then current UK GAAP, denying companies the future use of current UK GAAP. Under the new adoption framework, Company Alpha could use IFRS or FRS 102 for consolidated accounts. For individual accounts, it could adopt IFRS, FRS 101 or FRS 102 for individual accounts. For some of its subsidiaries, use of FRSSE was possible for certain subsidiaries' individual accounts. Company Alpha's regime options for different accounts are summarised in Table 2.

**Table 2: Company Alpha's Regime Choice for Different Types of Accounts (From 2015)**

| Regimes Choice / Accounts | IFRS | New UK GAAP | | FRSSE |
|---|---|---|---|---|
| | | FRS 102 | FRS 101 | |
| Consolidated accounts | ✓ | ✓ | × | × |
| Parent's individual accounts | ✓ | ✓ | ✓ | × |
| Subsidiaries' individual accounts | ✓ | ✓ | ✓ | ✓ |

**Figure 2: Decision Tree of UK Private Company Alpha (From 2015)**




Note:

(1) Utilities are given in the parentheses. Ratio utilities are given first, followed by net utilities. The adoption utilities of the FRSSE were not available in this case.
(2) The arrow indicates the decision-making process (viz. from techniques to regimes)
(3) The FRS 101 is only applicable to individual accounts. The FRSSE is only applicable to subsidiaries' individual accounts. Since these two regime choices cannot be used for all accounts, they are presented using dashed lines.
(4) The technique for treating incomes under FRS 102 is unfavourable for this firm.

To augment the mere denoting of choices of Table 2 with decision making content, we use Figure 2 to show the decision tree of Company Alpha from 2015. The arrow on the right pointing upwards suggests a colexicographic (CoLex) preference ordering proceeding sequentially from technique choices to regime choices. Ratio utilities and net utilities are given respectively in the parentheses of Figure 2. Originally, Company Alpha wanted to adopt FRS 102 for all its accounts, because it found this standard resembled current UK GAAP - and was simpler, involving less documentation. This suggests that Company Alpha preferred the *status quo* when facing changes in accounting policies (Messier, Quick, & Vandervelde, 2014). However, Company Alpha decided not to adopt FRS 102 because it found that the technique for treating incomes under FRS 102 to be unsuitable. This led Company Alpha to consider using IFRS for consolidated accounts from 2015. At the time of our interview, it was still evaluating which of IFRS or FRS 101 would be the more suitable for individual accounts. This case suggests that if there is a key technique which is heavily used, the company might switch to another regime just to sustain its use of certain financial reporting techniques. Thus, *technique choices can affect regime choices*.

In this illustrative case, Company Alpha scrutinised all options, including regime choices and technique choices. Since one technique was dominant in its two-stage choice problem, the firm first elected a technique and then made its regime choice. Thus, while the decision-making process was indeed sequential, it is distinct from the previous situation near year 2005, which was a Lex process. This time, the company's behaviour seemed to follow a co-lexicographic (CoLex) ordering (Castano & Castano, 2012). In this new preference ordering, CoLex, Company Alpha first compares the utilities of techniques and then decides techniques - ahead of regime choices.

The case of Company Alpha shows that companies' preference orderings might indeed change across times. Even though a company made regime choices and technique choices using the lexicographic ordering previously, it might apply the co-lexicographic ordering later. These diverse outcomes suggest that the relative importance of regime choices and that of technique choices can affect companies' preferences (Birnbaum, 2010; Castano & Castano, 2012; Colman & Stirk, 1999). If a company thinks regime choices have a larger impact than technique choices, it is more likely to apply the lexicographic ordering and make its accounting decisions sequentially, going from regime to technique. On the contrary, if a company is more concerned with technique choices than regime choices, it tends to employ the co-lexicographic ordering in this two-stage choice model. In addition, Company Alpha's decision-making processes were sequential in both cases, with procedures mainly relying on judgement, rather than naked science (e.g. spreadsheet modelling). As indicated by the respondent of this company, it was simpler for them to make decisions using the *staged* and *subjective* approaches (Burmeister & Schade, 2007; Einhorn & Hogarth, 1981).

Regarding the characteristics of the decision-making process, although regulated by relevant authorities to produce financial reports, the company was not under great external time pressure to do so. In this case, time pressure arose mainly from internal rather than external influences, and the company had its own schedule for financial reporting. Reflecting little time pressure, Company Alpha did not regard speed of preparing financial reports as a crucial to making accounting decisions. The interviewee said that *ease of execution* was more important than *transparency*. This might

be because Company Alpha was a private firm whose financial reports were aimed at internal control rather than at attracting external investors. The flavour of their internal processes was as follows. Decisions were normally made by teams, through group discussion, depending on input from the financial director and the expertise and knowledge of others. The company discussed important accounting issues with its own internal accountants. It measured risks subjectively, rather than modelling them explicitly (e.g. in a spreadsheet). The weather and the economic environment had a heavy influence on their sales of vehicles, which were the major risks to their cash flow. The company tried to use its size to diversify its risk. It found that risk reduction reduced the complexity of decision making. Playing to the professions of employees (i.e. matching training to job role) and seeking simplicity were significant to Company Alpha's decision-making process. Overall, we observe that being a private firm had a major influence on how Company Alpha prepared financial reports, and engaged in decision-making: organizational form counts.

## 3. Public Company Beta: Nested Choice

We turn now to Company Beta, a public company, as being illustrative of a firm that had a nested choice mode. As opposed to private firms, with their freedom of choice for all accounts, publicly listed firms must adopt IFRS for consolidated accounts. Public firms can only choose regimes for individual accounts freely. In focusing on public Company Beta, we aim to examine whether the difference in incorporation translates into any difference in their choice behaviour.

Company Beta is a manufacturing firm in the pharmacy industry. Technically, it is a medium-sized public firm located in the UK. Our respondent for Company Beta said that the essence of their choosing process depended on whether the adoption was swift and compulsory or more a matter of voluntary change.

If adoption of a regime is compulsory, as in the mandatory adoption of IFRS for consolidated accounts, the company will go to directly, from required adoption, to choosing a technique to support it. In this situation, the decision-making process is necessarily sequential, since the regime choice has been made (albeit involuntarily) and the company can then only choose from techniques which support the given regime. Nevertheless, Company Beta differs from Company Alpha, which also used a staged decision-making process, and made accounting decisions sequentially, when the time approached the year 2015, in that Company Beta was forced to make the regime choice first.

Arguably, complying with regulations dominates the two-stage choice problem. Thus, it was more important to Company Beta's decisions making that it has no option other than to adopt the required regime, than it is for them to be able to choose the technique that best supported it. Because Company Beta involuntarily adopted IFRS as its regime for consolidated accounts - necessarily before it considered technique choices - this firm is regarded as displaying a Lex ordering. Similarly, for firms like Company Alpha, if the importance of regime choices is clearly greater than that of technique choice, the company will apply the lexicographic ordering, and will make its financial reporting choices sequentially.

In the previous paragraph, it was argued that the preference ordering of Company Beta was lexicographic. This means the firm compared utilities of regimes and chose the one with the highest net-utility before considering technique choices. One important question to pose here is: what if Company Beta perceives higher utility in adopting other regimes, rather than implementing IFRS? Under these circumstances, even though companies are forced to make accounting decisions sequentially, it cannot be assured that firms will always adopt IFRS. One proposed explanation for compliance would be that regulations as such will influence a company's utility of accounting modes. For instance, if companies do not

comply with laws, they will face substantial costs and risks, such as fines or the cancellation of business operations (e.g. compulsory liquidation): and knowing this, they will adjust their utilities accordingly. Regardless of firms' original unbounded preferences towards financial reporting modes, restrictions that are embodied in the laws governing reporting might themselves transform utilities. That is, the accounting modes which firms are required to use, might generate the highest adoption net-utility after companies have weighed the disadvantage of violating laws. Hence, it could be argued that Company Beta rationally applied the lexicographic ordering in its two-stage accounting choice problem, and its utilities were affected by the laws/regulations.

From another perspective, this illustrative case study shows that the two-stage choice model of financial reporting regimes and techniques might be reduced to a one-stage choice problem when firms' choices are limited. Because of mandatory IFRS adoption, Company Beta had only one option of financial reporting regime. At that time, it only had choices over techniques. Hence, the accounting choice problem which it faced became a one-stage choice.

Notwithstanding this, it is worth investigating, as a thought experiment, how Company Beta would behave were it to have free choices, and asking whether the firm would make accounting choices differently, compared to the situation of tied choices. The interviewee asserted that were Company Beta to have had a free choice of regimes and techniques, it would have looked at regime choices and technique choices *together*, and made its decision to use a *nested* process (rather than Lex or CoLex). He explained that this was so because regime choices and technique choices were perceived as being tightly linked. Hence, using the nested decision-making process would be more appropriate were Company Beta to have completely free choices.

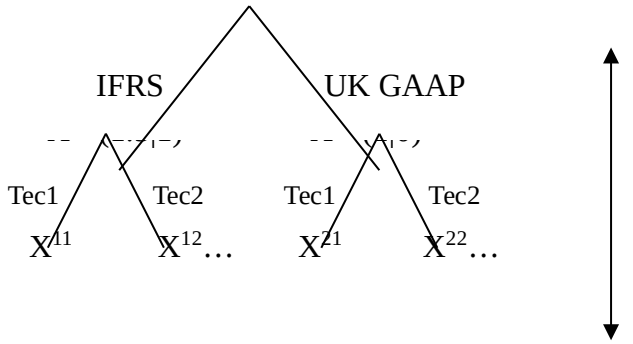
To expand on the kind of thought experiment mapped out in the previous paragraph, the respondent of Company Beta maintained that technique choices were crucial to assessing regime choices. Thus, when evaluating accounting modes, this company would examine all options available, and would investigate how they influenced financial reporting. This finding resembles that for Company Alpha, which looked at all choices, at the time

when it was facing the prospective policy changes from year 2015. Company Alpha applied a sequential decision procedure, and made its technique choices first because it had prioritised using a certain technique. However, the respondent of Company Beta stated that his company preferred to make nested decisions when it had free regime choices. The way Company Beta made accounting decisions for individual accounts, near to year 2005, provides a good example of a nested choice. Although Company Beta was required to adopt IFRS for consolidated accounts from 2007, it could freely choose IFRS or UK GAAP for individual accounts. The interviewee stated that investors preferred the company to adopt IFRS, as doing so could enhance the firm's comparability within the industry. Moreover, he pointed out that his company preferred the treatment of intangibles under IFRS to that under UK GAAP. These remarks reveal that Company Beta not only looked at costs and benefits of using techniques, but also studied those costs of adopting different regimes *per se*. These results suggest that Company Beta considered regime choices and technique choices simultaneously, and followed an un-staged (i.e. *nested*) decision-making process.

To advance the investigation further we asked our respondent whether he thought the un-staged process and the staged process would result in the same, or different, choice patterns. He replied that it depends on the importance of choices, because final decisions must meet the strategic goals of the company. This comment matches our early argument in this paper, that the relative significance of technique and regime choices will themselves play a role in determine companies' preference orderings and their decision-making processes.

Figure 3 shows the decision tree of Company Beta, which consists of two regime choices (i.e. IFRS and UK GAAP) and different alternatives of technique combinations under each regime. In this choice problem, Company Beta has various options, such as $X^{11}=(1.5|1, x_{11})$ and $X^{21}=(1|0, x_{21})$. The double arrow indicates that, in this example, the decision-making process of Company Beta is *nested.*

**Figure 3: Decision Tree of UK Public Company Beta (Individual Accounts, until the end of 2014)**




Note:

(1) Utilities are in parentheses: ratio utilities (B/C) first, then net utilities (B-C) e.g. IFRS chosen over UKK GAAP is indicated as $X^1 = 1.5 > X^2 = 1$ and $X^1 = 1 > X^2 = 0$
(2) The double arrow indicates that this is a nested decision-making process.

The following paragraphs apply the theoretical concepts mentioned in Section 1 to formalise the nested choice process. If a company's choice is $X^{ij}$, it means the firm chooses regime i, which brings the utility $x_i$, and technique combination j of this regime, which generates the utility $x_{ij}$. Unlike companies which deploy sequential decision-making processes (i.e., only compare $x_i$ or merely compare $x_{ij}$ in the first instance), a firm using a nested process will consider *all* utilities of regimes and techniques together. Hence, the firm's utility function of a joined accounting mode could be formally presented as $u(X^{ij})=f(x_i, x_{ij})$. The company will assign weights to various accounting choices, including both regimes and techniques. The weights reflect the importance of these choices, and influence the company's adoption utilities. The firm will choose the accounting alternative which leads to the maximum combined utility of the regime and the techniques. For example, this company will elect the accounting mode $X^{12}$ (regime 1 and technique combination 2) if the utility of mode $u(X^{12})$ is higher than $u(X^{11})$, $u(X^{21})$, and $u(X^{22})$. That is, regime 1 and technique combination 2 yield the highest utility than other joint options.

With regards to the utility function, it should be noted that firms often pay more attention to those accounting forms which help them to achieve their corporate goals. Firms have their own specific goals to meet, and the significance of each goal varies. Therefore, we would expect individual

firms to prioritise accounting choices differently, resulting in diverse preferences and utilities towards accounting modes, being observed in any fieldwork sample.

The above utility function can be applied to explain the nested choice of Company Beta. When Company Beta had free choices, it also considered regime choices and technique choices together, and chose the financial reporting mode with the maximum joint utility. Its final decisions depended on its goals and their priorities, and this is concordant with the interviewee's statement that the importance of his company's goals were significant determinants of whether (or not) a staged process or an un-staged process would lead to the same accounting choices.

The above suggest that when regime choices dominate the entire choice problem, companies are inclined to apply Lex orderings. When technique choices are highly important compared to regime choices, firms' preferences are more likely to be CoLex. Compared to the firms which have Lex or CoLex orderings, the companies which make decisions using un-staged (viz. nested) processes might have less clear ideas about the relative significance of their goals. For instance, Company Beta might understand its goals well, and have several crucial targets to accomplish. However, the relative importance of these goals to it might not be so obvious, and might be difficult to judge. Therefore, Company Beta made regime choices and technique choices simultaneously. Using the un-staged process also allowed Company Beta to accommodate to various key aspects of corporate goals, and thereby to achieve an overall better outcome. The respondent of Company Beta mentioned that when assessing accounting forms, it was important that the results met the expectation of the finance committee and the board. Thus, it could be inferred that the company gave more weight to those accounting modes which satisfied the board and the committee. Furthermore, this interviewee indicated that Company Beta used the un-staged procedure to make accounting decisions because of its unique business operations. For his company, the emphasis was on the whole organisation, rather than on any parts of it. Thus, decisions typically were not only about accounting, but about how the company was run, of which just one aspect was accounting. This explanation also suggests that the nested decision-making process adopted by Company Beta helped it to find better solutions, in general, by viewing

all decisions within the context of the health of the entire company.

In terms of attributes during the choice process, the respondent of Company Beta said that there was always time pressure. Nonetheless, he said that the schedule was almost the same for every year, so in that sense was predictable. He added that it is a very complicated process to interpret regulations properly, and fully to understand how the regulations influence the company. Certain accounting procedures, such as those for the treating of intangibles and acquisitions, were found to be especially difficult to implement. He said that these complexities slowed down the decision-making process. Since it is essential to meet deadlines and to have accurate financial reports, Company Beta tended to look for help from external experts, who assisted the company in making decisions quickly and professionally. Moreover, the interviewee indicated that the company preferred more evidence, rather than less, to make decisions, and to conduct a thorough analysis. Hence, most of the time, they did have 'to hand' the relevant data to support decisions. If they had to make decisions relatively quickly, they did so by judgement based on previous experiences (Burmeister & Schade, 2007; Einhorn & Hogarth, 1981). If the time for making decisions were extremely limited, they would sometimes use intuition. By contrast with Company Alpha, which often made decisions subjectively and cared more about the ease of execution, Company Beta used more decision support, with the aim of fostering precise financial reporting.

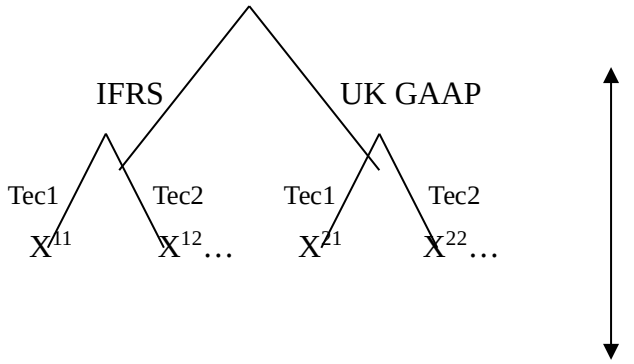
Furthermore, the Company Beta did not like uncertainty. It preferred creating alternatives which were more certain. Its major risk was with the market, which was prone to shifting sands commercially, especially for its principal product. To attenuate this risk, Company Beta conducted a lot of product forecasting, and looked carefully at market dynamics. It used devices like risk classes and scenario analysis to assist in handling these risks. Company Beta made accounting decisions by both teams and individuals. Key decisions went through the boards, and others were determined by the finance director and CEO.

Unlike Company Alpha, which depended on employees' judgements to measure risks and to choose accounting modes, Company Beta tended to require more visible evidence to support its decisions, cf March (1987). Such supporting information was also useful to Company Beta in applying an un-staged decision-making process, which aimed to accommodate various key aspects of the entire firm's operations.

## 4. Public Company Gamma: Nested Choice

This section examines the decision-making process of another public firm, Company Gamma, in confronting its two-stage choice problem of financial reporting. Company Gamma was a medium-sized UK service company which supplies properties-related solutions. As a public listed firm, Company Gamma did not have regime choices for consolidated accounts: it was only able to adopt IFRS. Hence, like Company Beta, Company Gamma elected the regime first, and then made its technique choices. Company Gamma also applied a sequential decision-making process, albeit reluctantly, when choices were tied. As with Company Beta, it could be said that the laws of mandatory IFRS adoption influenced Company Gamma's perceived utilities of regimes. In terms of the metrics we have adopted (viz. ratio, and net or difference utilities), regardless of its original unconstrained preferences towards various financial reporting regimes, for Company Gamma it was IFRS which led to the highest utility when the company took strict regulations into account. It can also be seen that the two-stage choice model contracts to a one-stage choice problem because of Company Gamma's compulsory adoption of IFRS.

**Figure 4: Decision Tree of UK Public Company Gamma (Individual Accounts, until the end of 2014)**




Note:

(1) Utilities in parentheses. Ratio utilities (B/C) given first, followed by net utilities (B-C), after the bar. The adoption utilities of UK GAAP were not available in this case.
(2) The double arrow indicates this was a nested decision-making process.

As contrasted with the 'tied' consolidated accounts, in which there was only Hobson's choice (take IFRS or leave), Company Gamma's accounting choices for individual accounts allowed free choices over both regimes and techniques. It could adopt IFRS or UK GAAP as the regime for both its parent's individual accounts and their subsidiaries' individual accounts. The respondent of Company Gamma explained that the company considered technique choices and regime choices *simultaneously* when faced with completely free choices. Hence, it used an un-staged process to make decisions. The decision tree of Company Gamma is shown in Figure 4 where the double arrow indicates a nested decision-making process.

This situation mimics how Company Beta responded to free choices, as mentioned in the previous section (i.e. Section 4). The utility function of a combined financial reporting mode, $u(X^{ij})=f(x_i, x_{ij})$, is relevant to the case of Company Gamma. When it faced the free choices for individual accounts, Company Gamma chose the joint regime and technique mode $X^{ij}$ which generated the maximum utility $u(X^{ij})$. The chosen accounting mode $X^{ij}$, consisting of the regime utilities $x_i$ and the technique utilities $x_{ij}$, was expected to achieve, overall, better results for Company Gamma because it evaluated regimes and techniques at the same time. The weights which Company Gamma assigned to various accounting choices, were said to be

influenced by its goals, and affected the form of its utility function.

The interviewee mentioned that individual accounts were perceived to be less important than consolidated accounts. Therefore, when Company Gamma was determining which accounting forms were best for its individual accounts, its criteria focused, first, on their *ease of execution* and, second, on their *credibility* - that is, it required that its financial reporting results should be perceived by its stakeholders to be reasonable. Furthermore, our interviewee pointed out that Company Gamma, generally judged the benefits of various accounting modes *subjectively*. He also thought that regime choices and technique choices influenced each other mutually, and were intrinsically linked. In addition, since regimes were converging and there was beginning to be no great difference among different regimes, we were told that Company Gamma did not examine choices in detail or in stages. Under these circumstances, it was easy to make decisions by the un-staged process. Using the un-staged procedure is consistent with Company Gamma's intention to complete tasks easily, with no downside on credibility.

We note that both Company Alpha and Company Gamma thought that the ease of execution was especially important during the decision-making process. Despite this concordance, Company Alpha applied the staged process; whereas Company Gamma used the un-staged process, when free choices could be made on financial reports. As discussed in Section 3, Company Alpha determined that certain regimes or techniques were much more favourable than others, in terms of accounting modes. Nevertheless, Company Gamma felt, *per contra*, that formally distinct accounting standards were in fact very similar. These disparate outcomes suggest that if a business such as Company Alpha were eager to achieve the goal of choosing a specific accounting form, which resulted in regime choices being much more significant than technique choices (or *vice versa*) it would apply a sequential decision-making process. By contrast, a firm like Company Gamma would tend to use a nested procedure to make decisions, if its various available accounting modes were of almost the same utility, and its regime and technique choices too were almost of equal importance. When it came to the process of decision making, and how it is developed, the respondent of Company Gamma said that its decision-making process was mainly judgement-based, cf. Bonner (1999), but with certain levels of

procedure support, including financial computation and scenario analysis. Both Company Alpha and Company Gamma looked for ease of execution during the decision-making process, and both tended to make decisions subjectively. Differing, to a degree, from Company Alpha, Company Gamma's decision-making process was sometimes based on procedures which provided enhanced information for decision-making. Using a nested decision-making process means that companies considered regimes and techniques together, and they tried to accommodate all aspects of accounting choices. In this situation, numerical data and other practical forms of evidences would be helpful to companies for making decisions. Thus, Company Gamma and Company Beta, which both made choices simultaneously when facing free choices, also both used supporting data to determine accounting modes, to some extent.

Further, the respondents of Company Beta and Company Gamma both stated they had to be sure that the results of financial reports met shareholders' expectations, when they evaluated accounting modes. Although the interviewee of Company Alpha mentioned shareholders as having an impact on accounting choices, it seemed this firm focused more on the ease of execution, and on simplicity, during the decision-making process, than on pleasing shareholders. One explanation for this difference might be the fact that Company Alpha was a private firm. However, Company Beta and Company Gamma, both of which were public firms, would probably have as much, or more, pressure from investors.

Additionally, the respondent of Company Gamma indicated that transparency and compliance were very important when preparing financial reports. Financial reports also needed to be prepared and completed quickly. This focus of transparency might also be related to the company's public character. In terms of the characteristics in the decision-making process, the interviewee felt that the decision-making process was not complicated, because all financial reporting standards are converging. Only some parts, like financial instruments, foreign exchanges, and judgemental aspects, were, to him, particularly difficult. Moreover, he mentioned that the risk and the uncertainty (most of which come from transactions) would influence significantly the decision-making process. Company Gamma often used risk classes to calibrate degree of risk. Our

respondent also stated that only briefly during the period of transitioning to IFRS would Company Gamma come under time pressure. Since the process to prepare financial reports had becomes routine, Company Gamma had not often been subject to time pressure. Company Gamma also participated in educational training for staff, to update their knowledge on accounting regulations, and to discover what the necessary changes were. Company Gamma usually had enough information to make rational decisions cf. Simon (1979). The "auditing company is the safe line," the respondent said. The auditing company itself provided the latest information about financial reporting laws. Company Gamma consulted the auditing firm about what it should do in response to current changes in accounting policy. Considering Company Gamma's relatively small firm size, it seemed that auditors had a crucial impact on the choice outcomes of this company.

## 5. Summary and Discussion

This paper has developed a theoretical framework for analysing the choices made by firms confronted with options on financial reporting regimes, and the techniques they use to support them. This approach uses a two-stage decision model, which distinguishes between lexicographic (Lex) and co-lexicographic (CoLex) decision modes (Castano & Castano, 2012; Colman & Stirk, 1999; Houy & Tadenuma, 2009). The under- pinning of this model, is a subjective utility-based view of decision making, which allows a calibration of preferences over regimes and techniques. The metric for this is based on a stated preference approach (Adamowicz et al., 1994; Hensher, 1994; Schipper, 2010), which allows the evaluation of alternatives in ratio utility (B/C) or net utility (B-C) terms. Using an e-questionnaire and a semi-structured interview agenda, interviews with CFOs and Financial Directors were undertaken. These were conducted with firms in the UK, and aimed to show what this model of regimes and techniques could reveal in realistic decision settings. Our interview instrument allowed the calibration of utilities experienced in our two-stage decision model. This was used to generate primary-source fieldwork data, exploring how companies behave within a two-stage choice model, and providing indications of stated preferences over regime and technique choices.

In brief, we investigated whether firms make decisions in stages, or all at

once, when facing choices across both regimes and techniques (Birnbaum, 2010; Colman & Stirk, 1999; Hensher, 1994; Tabuchi, 1994). If they determined the form of accounting reporting in stages, we asked them whether they dealt with the regime choice first, or the technique choice first. The theoretical underpinning to our paper was developed through a formal model, as explained in Section 1. This was elaborated into a supporting graphic narrative in Sections 2, 3 and 4, in which alternative two-stage modes were displayed simply by decision 'tree' graphs, based on the 'stated preferences' of companies (Adamowicz et al., 1994; Hensher, 1994; Schipper, 2010).

This form of analysis was applied to three case studies, Companies Alpha, Beta and Gamma. Our three case studies included one private firm and two public firms. We found that the private firm (Company Alpha) had faced free choices for both consolidated accounts and individual accounts. By contrast, the two public firms (Companies Beta and Gamma) were found to have 'tied' choices for consolidated accounts, but were at liberty to choose freely over their accounting modes for individual accounts.

When facing free choices, the three firms applied different decision-making processes. Company Alpha made accounting decisions in stages, but Companies Beta and Gamma determined financial reporting forms simultaneously. The case of Company Alpha revealed that this firm found a certain regime very favourable near the year 2005, and it was eager to adopt a specific technique when facing the subsequent policy change from the year 2015 onwards. For Company Alpha, the relative importance of regime and technique choices was obvious. Hence, it used the sequential decision-making process (Birnbaum, 2010; Colman & Stirk, 1999). Moreover, these findings imply that when regime choices dominate the entire choice problem, companies tend to choose the regime before making technique decisions, as happened to Company Alpha just before the year 2005. In this situation, the behaviour of firms can be explained by Lex orderings, which apply to companies that compare the utility of regimes first, when facing the two-stage choice problem of financial reporting regimes and techniques. In contrast, when technique choices were much more important than regime choices, companies elected to choose the technique first. Their preference orderings would accordingly be CoLex, since they compare the utility of techniques before assessing regimes

(Castano & Castano, 2012). The case of Company Alpha, making accounting decisions near to the end of year 2015, provides a good example of such a CoLex ordering.

When having free accounting choices, Company Beta and Company Gamma applied the nested decision-making process (Hensher, 1994; Tabuchi, 1994; Tu & Goldfinch, 1996). Company Beta aimed to take all key aspects into account when making decisions. The nested decision-making process helped Company Beta to have a better outcome for the whole organisation. For Company Gamma, there was no large difference across different standards. Hence, it was unnecessary for the firm to examine accounting modes in detail or in stages: it was easier to make decisions simultaneously. Our empirical analysis shows that Companies Gamma and Beta did not perceive clear distinctions between the significance of regime choices and of technique choices. This is probably the reason why they adopted the nested decision-making process, rather than a sequential process (the Lex or CoLex).

When companies make decisions by using un-staged processes (viz. nested), they consider regime choices and technique choices at the same time. They will choose that financial reporting form which leads to the best result for them (i.e. the maximum utility) when various crucial aspects have been taken into account, including regimes and techniques. Their utility functions can be expressed as $u(X^{ij})=f(x_i, x_{ij})$, whose form is associated with companies' priorities in financial reporting (e.g. the relative importance of regime and technique choices). As mentioned by the respondent of Company Beta, companies' goals will determine whether the nested and the sequential decision-making processes can result in the same accounting pattern. Since the focus is different across firms, companies might assign different weights even to the same accounting mode. Hence, firms choose different financial reporting forms and make accounting decisions differently (i.e. in stages, or not, and using the lexicographic or co-lexicographic orderings).

For Company Beta and Company Gamma, they had tied choices when preparing financial reports for consolidated accounts. As public firms, they could only use IFRS as the regime for consolidated accounts. Thus, compulsory IFRS adoption forced public companies to elect the regime

before they could choose techniques. In a sense, they applied the staged decision-making process involuntarily. In addition, regardless of companies' original utilities of adopting various financial reporting regimes, IFRS yielded the highest adoption utility after they took account of the substantial costs of violating the laws. Our results show that regulation can transform firms' utilities of accounting modes. Thus, we have companies adopting IFRS, which generated a better utility in the first stage of the choice problem. On the other hand, it could be said that the two-stage choice model will be reduced to a one-stage choice problem when choices are tied. Because of mandatory IFRS adoption, public firms only have technique choices and face a one-stage accounting choice problem.

Furthermore, our case studies suggest that the decision-making process will change over time. As discussed in Section 2, Company Alpha applied a lexicographic (Lex) ordering near 2015, but then used a co-lexicographic (CoLex) ordering later (from 2015). The alteration in Company Alpha's preference orderings resulted in a new decision appraisal, changing the relative utilities of regimes and techniques choices across time.

The results reported in this paper also show that firms have different styles of evaluating various accounting modes. For instance, Companies Alpha and Gamma tended to assess financial reporting modes subjectively, because they sought ease of execution. In contrast, Company Beta preferred to judge its accounting alternatives with the help of tangible evidence cf. O'Reilly (1983) and Bruns (1968). Company Gamma also used numerical data and scenario analysis, as necessary, to help its decision-making. It should be noted that both Companies Beta and Gamma applied the nested decision-making process when confronted with free accounting choices. When companies make decisions simultaneously, they need to consider all key aspects at the same time. In this situation, supporting data might be very helpful cf. March (1987). Therefore, it is no surprise that both Companies Beta and Gamma liked to have support by data when making accounting decisions.

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## Instrumentation

Full information on the instrumentation is available at: Hsu YL, Reid GC, Smith JA. Data for “Stated preferences: Accounting costs and benefits of UK firms 2013-2014”, University of Strathclyde 2021, see: https://doi.org/10.15129/51540e98-0613-4772-9f9a-fe0b908473bb

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